

From Nanoparticles to Cancer Diagnosis

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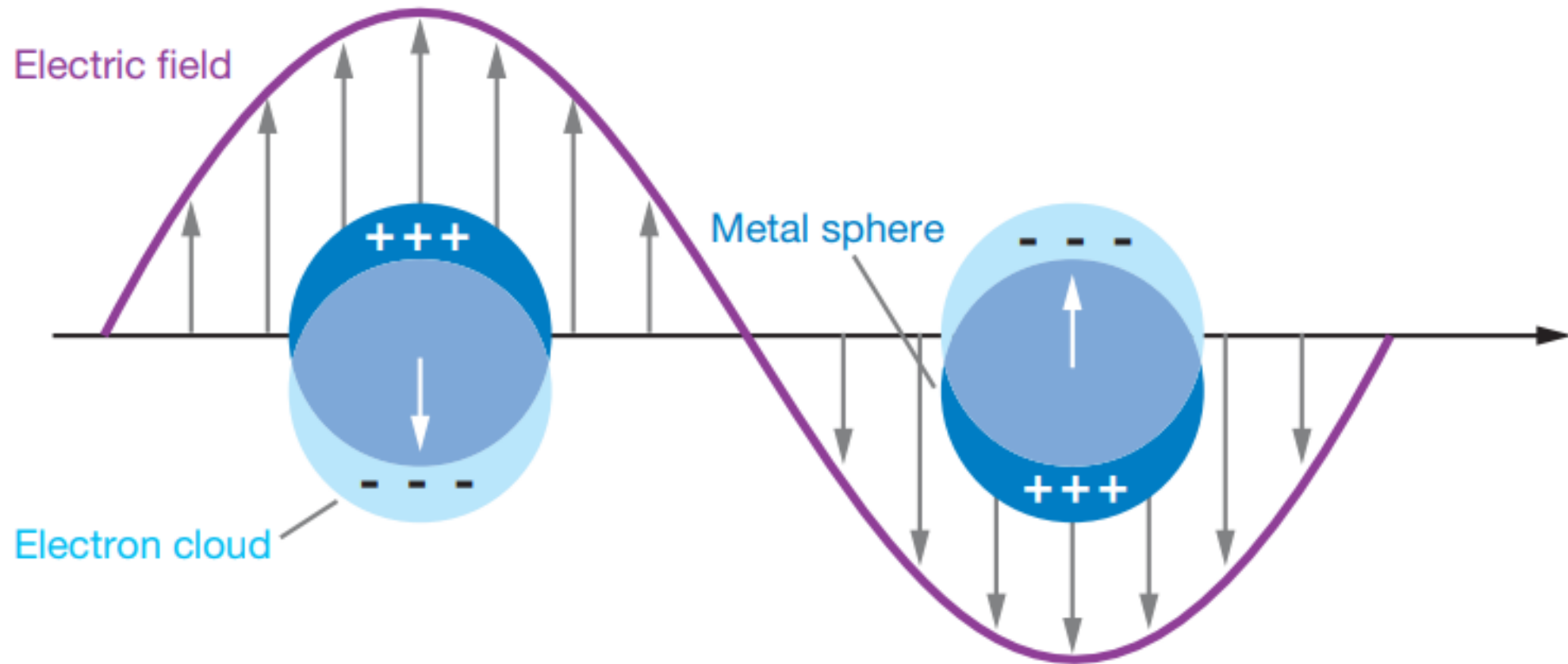
Nanoparticle sensors applications:

- Medical Diagnostic
- Environmental Monitoring
- Food Safety and Quality Control



Rodríguez-Oliveros, R., Paniagua-Domínguez, R., Sánchez-Gil, J. A., & Macías, D. (2016). Plasmon spectroscopy: *Theoretical and numerical calculations, and optimization techniques*. *Nanospectroscopy*, 1(1).

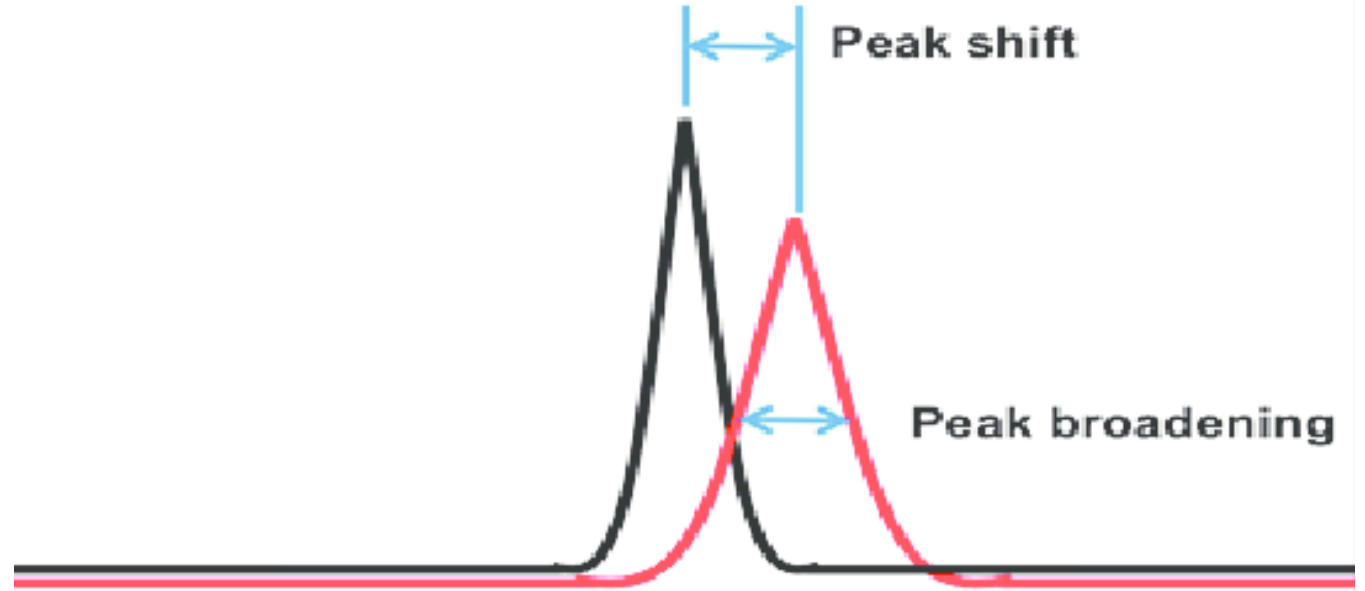
Localized Surface Plasmon (LSP)



Calculations

$$\bullet S = \frac{\Delta\lambda}{\Delta n}$$

$$\bullet \text{FoM} = \frac{S}{\text{FWHM}}$$

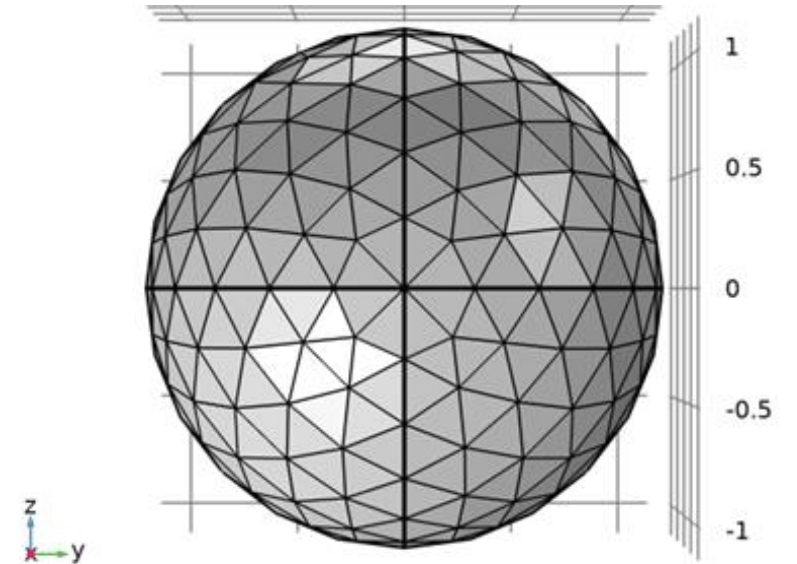


Abdullah, Y., Husain, H., Hak, C. R. C., Alias, N. H., Yusof, M. R., Kasim, N. A., ... & Mohamed, A. A. (2015, April). A short note on physical properties to irradiated nuclear fuel by means of X-ray diffraction and neutron scattering techniques. In *AIP Conference Proceedings* (Vol. 1659, No. 1). AIP Publishing.

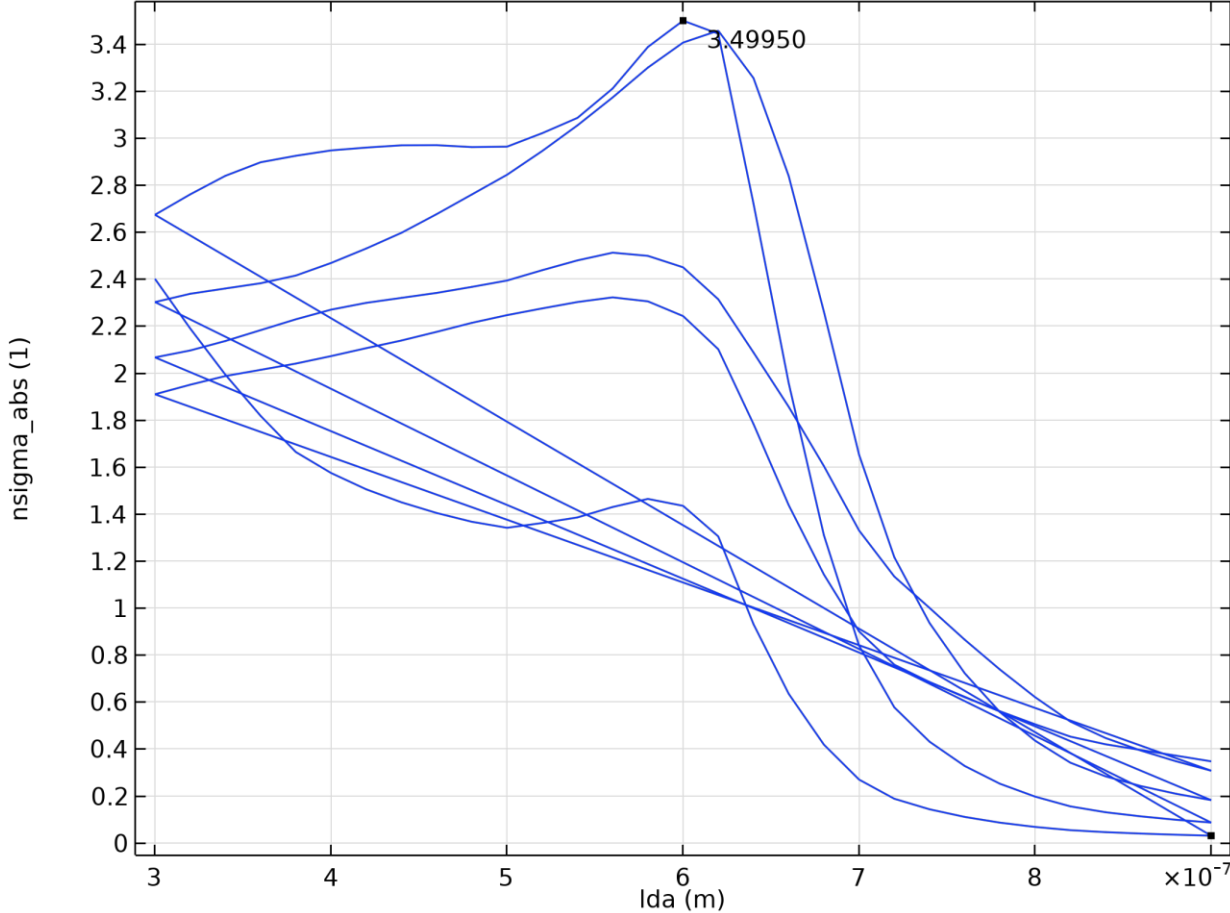
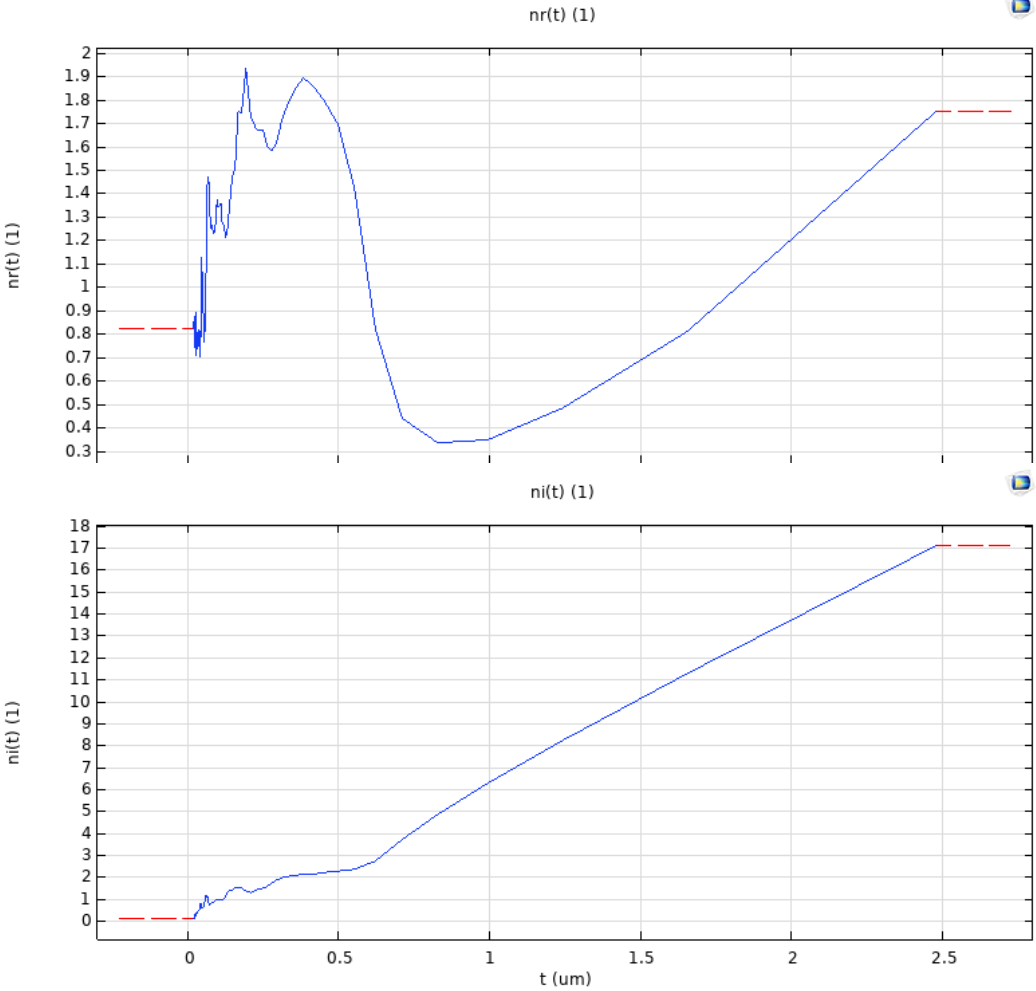
Method and Software

COMSOL Multiphysics is a finite element analysis, solver, and simulation software package. What we do is:

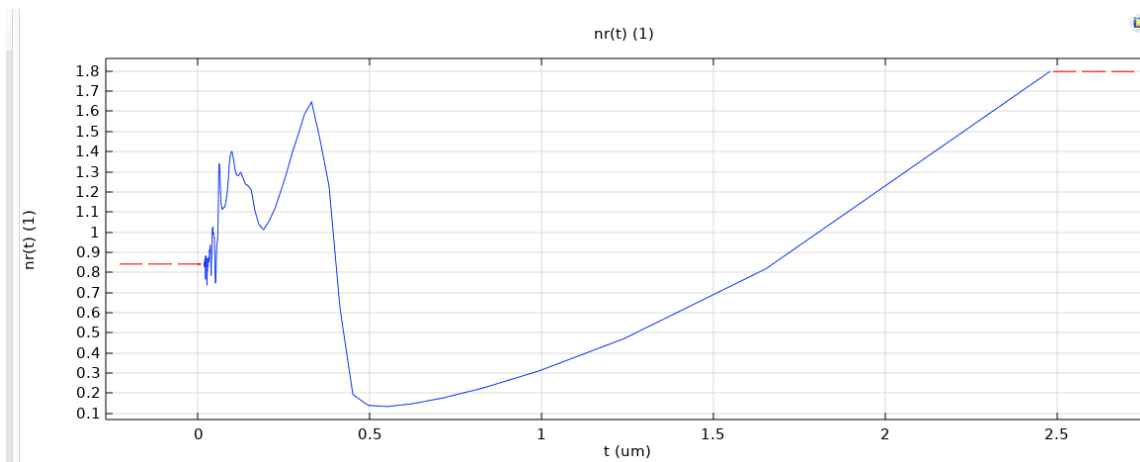
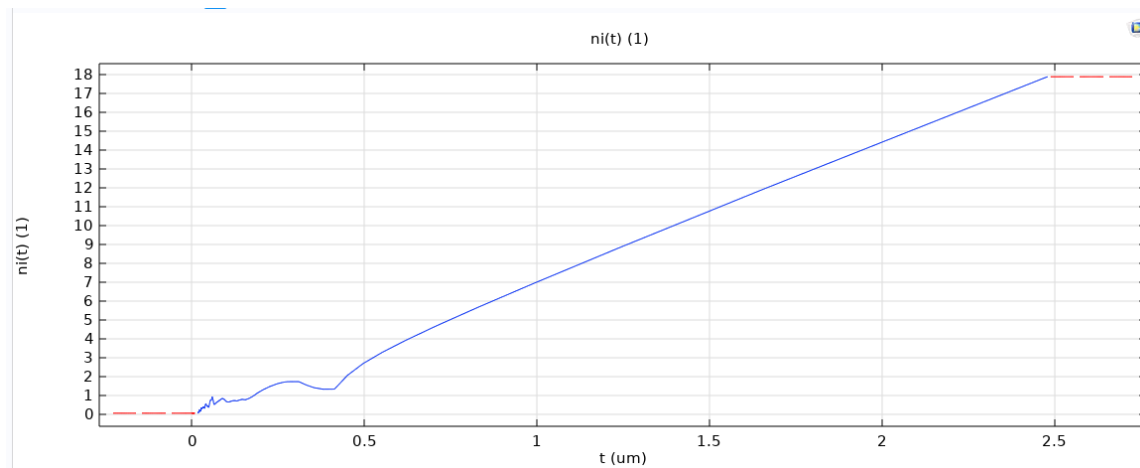
1. Define nanoparticle geometry and material properties.
2. Set up the physics.
3. Meshing
4. Simulate and Analyze.



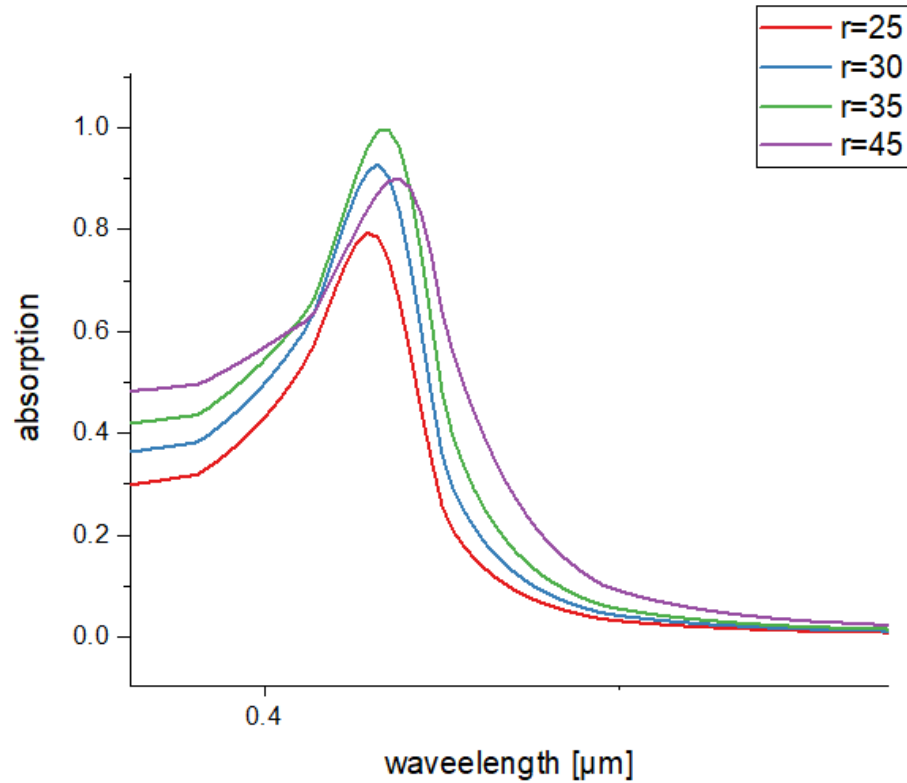
Results (Au)



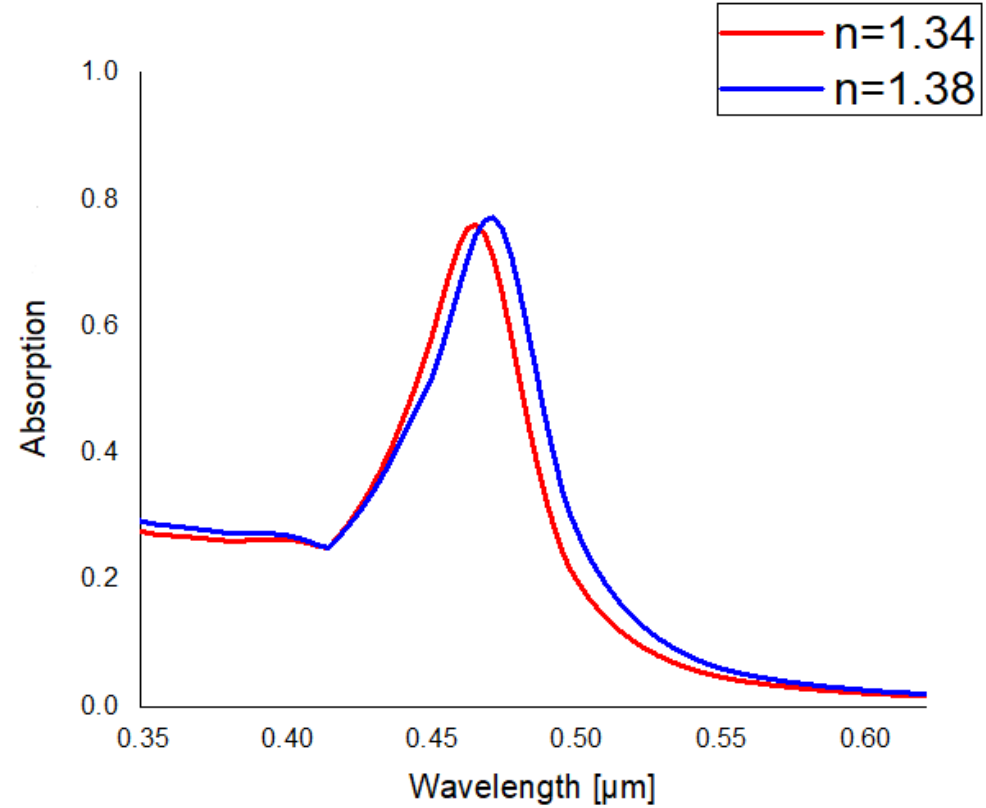
Results (Ag)



Results (Ag)

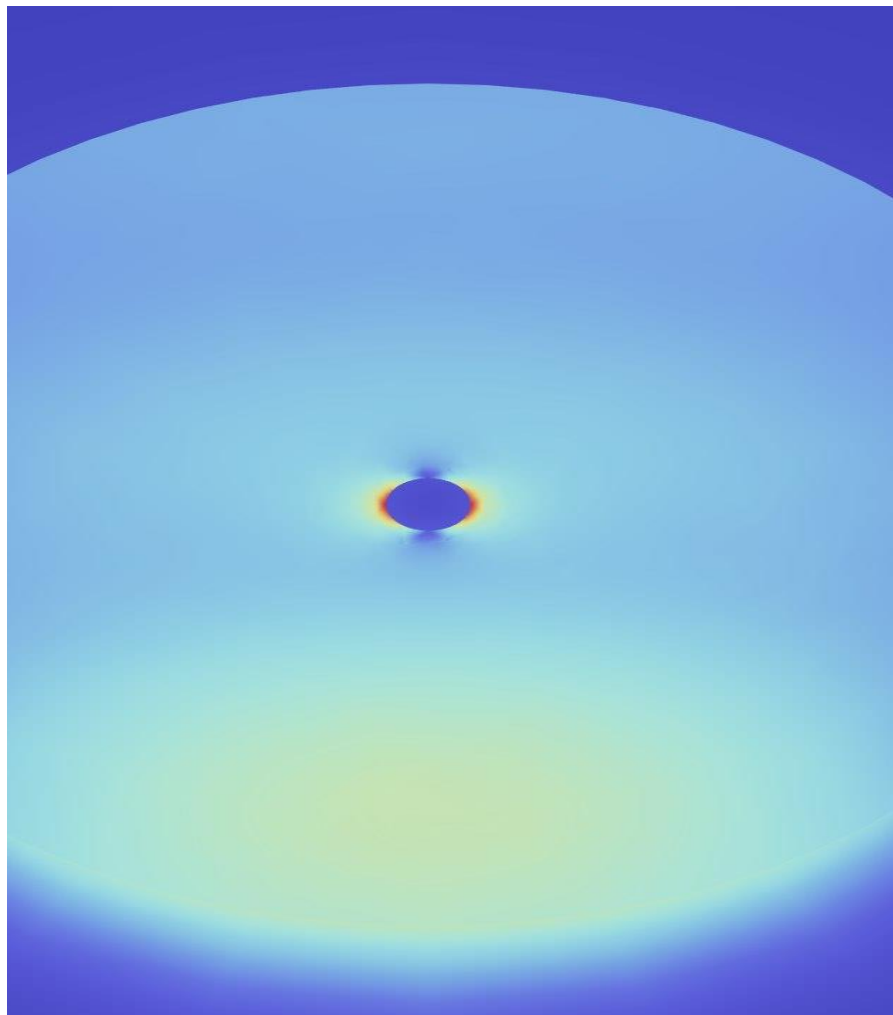


$S = 150$



$Fom = 3$

The Electric Field



Thank you!